WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE
BUREAU OF BIOLOGICAL SURVEY
UNITED STATES DEPARTMENT OF AGRICULTURE

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Washington, D. C. No. 11 February, 1938

Biological Survey: Annual Report, 1936-37

Gabrielson, Ira N. Report of the Chief of the Bureau of Biological Survey, 1937 (Superintendent of Documents, Washington, D. C., 10 cents a copy), 63 pp., 6 tables, U. S. Government Printing Office, 1937.

A report presented concisely under more than 60 heads is difficult to summarize. All phases of the Bureau's work are treated and this is the only publication that does describe Biological Survey activities with so wide a scope. Those interested in the research work will find an outline of progress in all its branches. The work of cooperative research units and the investigation of wildlife management as a supplementary farm enterprise will no doubt be of special interest to readers of WILDLIFE REVIEW. In economic investigations the ecology, propagation, and control of waterfowl food plants, mosquito control operations in relation to wildlife habitat, management studies, and control of destructive species probably will have similar appeal. The operations of the Bureau in fur-animal investigations and in wildlife diseases are summarized. Corresponding to major activities of the period, the sections on acquisition of lands for refuges, the migratory-waterfowl restoration program, and administration of national wildlife refuges are prominent. Federal enforcement of wildlife conservation laws also receives attention.

Conservation: Brown pelican

Anon. The brown pelican, Texas Federation of Nature Clubs (7460 San Benito Way, Dallas, Tex.), 5 pp., cover photo, 1 graph.

Plea for protection of this species on the Texas coast where it is now persecuted, based chiefly on quoted arguments as to the worthless character of the fishes on which the birds chiefly feed. There is only one colony now on the Texas coast where there were 17 in 1918 and 500 individuals where there were then 5,000.

Conservation: Crow

Emergency Conservation Committee. Man's friend: the crow (Emergency Conservation Committee, 734 Lexington Ave., New York, N. Y.), Publication 65, 10 pp., 1 photo, Sept. 1937.

Two articles by Ellsworth D. Lumley "The crow as a 'villain'" (abstracted in WILDLIFE REVIEW, No. 7, December 1936, p. 2), and "The crow in relation to waterfowl", reprinted from Nature Magazine, together with an introductory sketch. The last makes points in favor of the crow, criticizes methods of the anti-crow campaigns, and discusses the crow's activities from the balance-of-nature point of view.

Conservation: Hawks

Pough, Richard H. Iowa hawks and their ecological niches, Iowa Bird Life (Winthrop, Iowa, 15 cents a copy), 7(4), Dec. 1937, pp. 42-43 (1 page of half-tone figures).

Brief account stressing general utility of the hawks accompanied by plate showing shape and markings of common kinds with spread wings as seen from below.

Conservation: History in Wisconsin

Scott, Walter E. Conservation history, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison, Wis.), 2(9), Sept. 1937, pp. 26-31.

Continuation (1915-18) of the chronological account of the State's conservation activities. See also WILDLIFE REVIEW, No. 9, July 1937, p. 3, and No. 10, Oct. 1937, p. 3.

Conservation: Owls

Lumley, Ellsworth D. Owls. With preface by Paul L. Errington, Emergency Conservation Committee (734 Lexington Ave., New York, N. Y.) Publication 67 (Teaching Unit 5), 10 pp., illus., 1 table, Sept. 1937.

References given to 13 papers from which information was drawn. General discussion of owls, their adaptations for hunting, the study of their food, persecution of owls especially by pole traps, and "the real truth of predation." Short statements as to the food of 11 groups of owls, still briefer tabulation of distribution, size, and food of 14 species. Summary of State laws relating to owls; 3 give all species protection, 15 protect none. Suggestions for essays about owls. The preface, by Errington, sketches his change of views as to owls from boyhood through his experience in natural history investigations to date, and gives a summary of his views on predation. It is no more wrong for an owl to eat a bird than for the bird to eat an insect. In general what a predator preys upon is determined by what is most available. The owls themselves have their losses from predation and other causes and their numbers remain fairly constant from year to year. Some degree of control, especially of the great horned owl, may at times be desirable.

"The advisability of campaigning against Horned Owls in the wild depends upon circumstances--where the owls are and what they are doing, whose interests would be served by killing them, and what assurance that anything worthwhile would be achieved thereby. But whatever may be the legitimate place of predator control in the activities of a community, any control undertaken should always be conducted with moderation and discrimination and with full awareness of its shortcomings. From the standpoint of game management alone, over-emphasis of predator control may result not only in the diversion of time, effort, and funds from more productive endeavor, but it may result in the unnecessary sacrifice of species without which our out-of-doors would be sadly lacking. Our owls--the 'good' and the 'bad' alike, among other native wild creatures--belong to our woods and our prairies, and it is our duty to insist that they as a part of our heritage be administered with reasonable forethought and care."

Conservation: Peat land in relation to wildlife

Dachnowski-Stokes, A. P. Peat land for wildlife, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 26(4), July-Aug. 1937, pp. 55, 62-63, 3 photos.

Failure in obtaining agricultural land by draining peat areas are chiefly due to wrong selections. Choice should be made by scientific methods and unsuitable areas should not be drained. The great capacity of peat for storing water and its corresponding importance in maintenance of environment for wildlife are emphasized. Suggestions are made for improvement of public policy respecting peat lands. Bibliography of 7 titles, all by the author.

Control: Bird damage to cherries

Cardinell, H. A. Protecting cherries from birds, Mich. Agr. Expt. Sta. Circ. Bul. (Michigan State College, East Lansing, Mich.) 160, 22 pp., 7 figs., 4 tables, May 1937.

Review of both European and American publications referring to destruction of small fruits, especially cherries. Losses in Michigan orchards chiefly to robins and starlings. Notes on protective devices, of which the automatic acetylene exploder was found effective and economical; description of the exploder and of its use. Bibliography of 26 titles.

Control: Coyote

Young, Stanley P., and Harold L. Dobyns. Den hunting as a means of coyote control, U. S. Dept. Agr. Leaflet (Superintendent of Documents, Washington, D. C., 5 cents a copy) 132, 8 pp., 2 figs., Oct. 1937.

Importance of den-hunting; qualifications and equipment of the den hunter; breeding habits and number of young of the coyote; denning sites and habits; methods of den-hunting; activities of whelps; removing whelps from dens; trapping and shooting adults.

Control: The "vermin" problem

Reese, Albert M. The destruction of "vermin", Scientific Monthly (Science Press, Lancaster, Pa., 50 cents a copy), 40, 1937, pp. 349-353, 1 table.

"The term "vermin" is applied to animals supposed to be harmful to the few species that the sportsman wants to kill. The word and accompanying philosophy are derived from European game keepers among whom it is said "vermin" control was carried to such an absurd length as to call for killing of nightingales because they disturbed the sleep of pheasants. The writer cites as "vermin" control in the United States, the Federal predatory animal campaign and the activities of certain State game departments. He gives a tabulation of the animals killed in "vermin" control contests in an "Eastern State" [which happens to be his own--West Virginia] and comments on the

indiscriminate slaughter of groups, as snakes, hawks, and owls, without regard to the differing merits of species. He challenges classification of chipmunks as "vermin" and might have gone farther as the list includes sparrows, turtles, and terrapins. Arguments against sweeping "vermin" control are quoted from Errington and Grinnell in the United States and Kinghorn and Thompson relative to Australia. Nineteen out of 27 State game commissioners expressed themselves in favor of "vermin" control campaigns. The article reproduces resolutions of the American Society of Mammalogists urging modification of Biological Survey predator control and a protest by the American Society of Zoologists and the Ecological Society of America against wholesale destruction of wildlife.

Cycles

Wing, Leonard W. Wildlife and cycles, American Forests (919 Seventeenth St., Washington, D. C., 35 cents a copy), 43(10), Oct. 1937, pp. 496-497, 512-513, 4 photos, 1 graph.

A popular account of cyclic phenomena especially in game species and their relation to hunting practices and regulations.

Cycles: Snowshoe hare

MacLulich, D. A. Fluctuations in the numbers of the varying hare (Lepus americanus), Univ. of Toronto Studies, Biol. Ser. (University of Toronto, Toronto, Canada, $1.25 a copy), 43, 136 pp., 18 figs., 18 tables, 1937.

Review of previous work especially of findings based on fur returns of the Hudson's Bay Company. History of fluctuations as revealed by fur returns, literature, and questionnaires; 6 maps, for as many seasons, show the records for Ontario. Given phases of the cycle occur progressively, not simultaneously, in different parts of Canada and Alaska. The abundance of the lynx is shown to be definitely correlated with that of the hare; fluctuations of neither are correlated with sunspot periodicities. No cause of the cycles is indicated. It is concluded that the relaxation oscillations of Gause describe the fluctuations of the hare, rather than the "classical" equations of Volterra. ["Describe" is the proper word, the mathematics explain nothing. Gause's work deals with entirely abnormal competition in microcosms of protozoan species that have existed together in nature without materially damaging one another through periods of time, probably only to be described in geological terms.]

The publication contains a great deal of information on life history of the hare, both compiled and derived from field work, the methods of which including trapping, censusing, and observing are described. Formula is given for converting figures for abundance of droppings into numbers of hares. The range in numbers, namely, from 0 to 5,000 per square mile, is astonishing. The number and growth of young, and the body temperature, food, habitat, territory, cruising radius, forms and burrows, and nocturnal habits of adults are life history topics treated. There is a review of epizootics caused by bacteria among animals in general, an extended account of the bacteriology of the hare, and a catalogue of the normal bacterial flora of the species as

determined by this study. Both external and internal parasites are considered; one of the latter group, a blood-sucking stomach worm (Obeliscoides cuniculi), is known to have caused an epidemic in the wild. There are 10 pages of bibliography.

Destruction: By arsenical baits

Reed, Watson E. Grasshopper poison and wildlife, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 26(4), July-Aug. 1937, pp. 53, 61, 64, 3 photos, 2 tables.

Review of Whitehead's report on same subject for Oklahoma, and report on author's studies in Iowa. Devastation by grasshoppers affected not only crops but all plants and greatly reduced the plant food supply for wildlife. Tables show the percentage of the food made up by insects and by grasshoppers alone of small collections of 17 species of birds and 9 of mammals. There are field notes on food habits and reports on animals found dead. "On not a single farm where the poison bait had been used according to directions x x x was a domestic or wild animal found poisoned." Bibliography of 4 titles.

Destruction: Effects of arsenical sprays

Frost, Allen. Effect upon wildlife of spraying for control of gipsy moths, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 2(1), Jan. 1938, pp. 13-16.

Description of the site of the observations and lists of birds seen on sprayed and unsprayed areas; these were in the proportion of 18 to 154. Brief notes on a few other vertebrates. New York.

Destruction: Muskrats by drowning

Errington, Paul L. Drowning as a cause of mortality in muskrats, Journ. Mammalogy (Wm. H. Burt, University Museum, Ann Arbor, Mich., $1.00 a copy), 18(4), Nov. 1937, pp. 497-500.

Flooding, prolonged intense wave action, and accidental dragging of suckling young into water by their mothers, result in drownings, sometimes in surprising number. The losses appear to occur in proportion to density of population.

Diseases and Parasites: Avian coccidiosis

Boughton, Donald C. Notes on avian coccidiosis, The Auk (3200-22nd St., North, Arlington, Va., $1.00 a copy), 54(4), Oct. 1937, pp. 500-509, Pl. 31, table.

Brief statement of life cycle of coccidia of which 2 genera, Isospora and Eimeria, occur in birds. In abundance they cause disease, coccidiosis, symptoms of which are described. Treatment is ineffective but sanitation can

prevent serious infection. Diagnosis; spores and infected tissue illustrated. A tabulation cites orders of birds from which coccidia have been reported; annotations include critical notes and the number of species recorded as affected. Orders from which coccidia have not been reported are listed. Host-specificity and other scientific problems associated with coccidia are discussed. Bibliography of 26 titles.

Diseases and Parasites: Avian malaria

Huff, Clay G. A new variety of Plasmodium relictum from the robin, Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(4), Aug. 1937, pp. 400-404, 2 figs., 1 table.

A new strain of avian malaria, description, life history; infectivity for various mosquito species. Bibliography of 9 titles.

Diseases and Parasites: Blood parasites, Nebraska birds

Coatney, G. Robert, and Robert L. Roudabush. Some blood parasites from Nebraska birds, American Midland Naturalist (University of Notre Dame, Notre Dame, Ind., 50 cents a copy), 18(6), Nov. 1937, pp. 1005-1030, 3 pls., 1 table.

Report on studies of blood parasites found in 26 out of a collection of 89 specimens of Nebraska birds. Haemaproteus, 8 species, 4 spp., and 1 var., described as new; Leucocytozoon, 4 species of which 2 vars. are d.a.n.; Trypanosoma 1 species; Microfilaria, not specifically determined. Bibliography of 41 titles.

Diseases and Parasites: Choanotaenia

Horsfall, Margery W., and Myrna F. Jones. The life history of Choanotaenia infundibulum, a cestode parasitic in chickens, Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(5), Oct. 1937, pp. 435-450, 1 pl., 1 table.

Review of literature to 6 titles of which references are given. Procedure in experimental studies of transmission through alternate insect hosts; morphology; life history. This parasite is known from various wild birds, chiefly gallinaceous, of which the following occur in the wild in the United States: European partridge and ring-necked pheasant.

Diseases and Parasites: Coccidia in reptiles

Roudabush, Robert L. Some coccidia of reptiles found in North America, Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(4), Aug. 1937, pp. 354-359, 5 figs.

Most examinations have given negative results, but several positive determinations are recorded for 4 forms, 2 of which are described as new species and 1 as a new variety. Bibliography of 6 titles.

Diseases and Parasites: Control in propagated game birds

McKenney, F. D. Disease control in the propagation of game birds, Modern Game Breeding (J. A. Gardy Printing Co., 23 W. State St., Doylestown, Pa., 25 cents a copy), 7(10), October 1937, pp. 4-5, 14.

Importance of choosing proper site and of avoiding overcrowding. Propagating systems in use and suggestions for sanitation adapted to each, especially the segregation and care of hens. Mechanical incubation and brooding rapidly replacing other methods make sanitation easier. Construction and care of holding pens and other inclosures. Precautions to be used in connection with feeding. The suggestions are directed toward the care of both upland and aquatic game birds.

Diseases and Parasites: Deer hosts of cattle tick

Anon. Ticky deer in Florida, Florida Cattleman (Kissimmee, Fla.), 2(2), Nov. 15, 1937, pp. 11, 14, 1 map.

Examination by the Federal Bureau of Entomology of various birds and mammals collected in an area infested by the tropical cattle tick revealed ticks only upon deer. Experiment proved that the ticks grow and reproduce upon deer almost as rapidly as on cattle. Ticky deer are limited to three well-separated and restricted areas, the location of which is shown on the map. These areas are private and State game preserves and must be cleaned up "if Florida is ever to complete the work of tick eradication."

Diseases and Parasites: Differential mortality of sexes from gapes

Whitlock, S. C. An apparent case of sexual difference in resistance to parasitic infection, Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(4), Aug. 1937, p. 426.

Of 34 cases of infection of Hungarian partridges by the gapeworm (Syngamus trachea), about half of them fatal, 32 were in females.

Diseases and Parasites: Foot and mouth disease

Creaght, ------. Foot and mouth disease. The search for the carrier and the need for an antidote, The Field (Breams Bldgs., Chancery Lane, London, England, 2 shillings a copy), 170(4330), Nov. 20, 1937, pp. 1346, 1348.

Discussion of occurrence, symptoms, and importance, especially in Great Britain. Notes on possible carriers including various birds, as house sparrows and starlings, all of which have thus far proved quite unaffected by the virus and incapable of carrying it. The author says in this regard: "I think we are forced back to the earlier and proved theory that the disease is spread by the movements of undiagnosed farm animals and by human beings who have been in contact with them."

Diseases and Parasites: Mink-worm

LaRue, George R., and Donald J. Ameel. The distribution of Paragonimus, Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(4), Aug. 1937, pp. 382-388.

Synopsis of world, and North American records. The life history is passed in crayfishes, snails, and mammals; the most frequent host in the last-named group appears to be the mink. Extensive bibliography.

Diseases and Parasites: Minnesota investigations

Green, R. G. et al. Minnesota Wildlife Disease Investigation (Dept. of Bacteriology, University of Minnesota, Minneapolis), July-Sept. 1937, 3 issues comprising pp. 107-140, and tables 56-77.

Cooperators in this investigation and full authorship of the reports were recorded in WILDLIFE REVIEW, No. 10, October 1937, p. 7. The pathology and parasitism of snowshoe hares receive considerable attention; in a summary (pp. 124-126) of investigations to date, the announcement is made that "It is apparent both from positive and negative data that the primary cause of the periodic decimation of the snowshoe hare population in Minnesota is shock disease." Recognition of the disease by symptoms, lesions, and chemical findings is discussed on pages 134-136. There are the usual pathological reports on miscellaneous specimens.

Autopsies on quail from a game farm revealed wounds resulting from pecking, dietary deficiencies, ulcerative enteritis as the leading causes of death. Beaver were proved to be mortally susceptible to experimental infection with tularemia. Notes by Drs. Green and Ralph Dowdell report progress in the development of non-toxic alloy for shot to be used in wild fowling; in the alloys thus far tested, apparently a magnesium content of more than 1 percent is necessary for shot that can be disintegrated and eliminated in 24 hours by the digestive process in mallard ducks. There is an account (pp. 128-132) of botulism among waterfowl (of 11 species) in western Minnesota, with notes on parasites revealed by dissections.

Diseases and Parasites: Myiasis

Knipling, E. F., and H. T. Rainwater. Species and incidence of dipterous larvae concerned in wound myiasis, Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(5), Oct. 1937, pp. 451-455.

The true screw-worm (Cochliomyia americana) was involved in about 90 percent of the total number of cases of myiasis investigated in southeastern States; larvae of 7 other genera were found as secondary species. Some of the hosts were wild species (opossum, gopher tortoise) but the great majority were domesticated animals.

Diseases and Parasites: Nematode in cormorant

Thomas, Lyell J. On the life cycle of Contracaecum spiculigerum (Rud.), Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(4), Aug. 1937, pp. 429-431.

Natural and experimental infestations of fishes with this nematode with which cormorants become infected by eating the worms encysted in fishes.

Diseases and Parasites: Schistosomids

McLeod, J. A. Two new schistosomid trematodes from water-birds, Journ. Parasitology (Lime & Green Sts., Lancaster, Pa.), 23(5), Oct. 1937, pp. 456-466, 2 pls., 1 table.

Of 91 specimens representing 17 species of Canadian water-birds, 21 of two species, the herring gull and the blue-winged teal, were found infested with schistosomid blood parasites which are described and figured as new species: Pseudobilharziella querquedulae and Ornithobilharzia lari.

Diseases and Parasites: Ticks of Oregon

Chamberlin, W. J. The ticks of Oregon, Agr. Expt. Sta. Bul. (Oregon State College, Corvallis) 349, 34 pp., 11 figs., 1 table, June 1937.

General account of ticks; their economic importance; and role as disease carriers especially of Rocky Mountain spotted fever and tularemia (4 others mentioned in a table). List and systematic account of ticks occurring in Oregon; life cycle of a tick; list of the known hosts, mostly wildlife species, of Oregon ticks. Bibliography of 45 titles on ticks in general and of 34 on the spotted-fever tick and tick-fever.

Ecology: Causes of game scarcity

Bump, Gardiner. Game scarcity--some causes and cures, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 26(4), July-Aug. 1937, pp. 51-52, 58-60, 1 photo, 1 chart, 1 graph, 6 tables.

Notes on causes of scarcity. The types, cyclic, regional, and local, are analyzed in the chart and discussed in the text as to character, suggested causes, and possible alleviating practices. Application of the reasoning advanced to the general decrease in 1935-36 of pheasants in New York and New England reveals that there are too many unknowns to warrant the drawing of conclusions as to cause.

Ecology: Census methods

Anon. Methods in wildlife censuses, Journ.Amer. Statistical Assoc. (450 Ahnaip St., Menasha, Wis., $1.50 a copy), 32, Sept. 1937, pp. 537-542.

This paper, prepared in the Division of Wildlife Research, U. S. Biological Survey, comments chiefly on census methods that have been employed by that organization. They relate to beavers and other fur animals, kangaroo rats and other small mammals, jack rabbits, big game, colony-nesting birds, small birds, and waterfowl.

Ecology: Drainage control

Vogt, Wm. Thirst on the land, National Assoc. Audubon Societies Circ. (1775 Broadway, New York, N. Y.) 32, 32 pp., illus., 1937.

The subtitle, "A plea for water conservation for the benefit of man and wild life," indicates the message of the paper which cites the value of "living" swamps and marshes and the undesirable results of draining them. Drainage control is held to be a necessity and suggestions are made as to how it may be achieved. The paper is illustrated by 4 cartoons by J. N. Darling, and includes a bibliography of 48 titles.

Ecology: Mapping vegetation

Dalke, Paul D. The cover map in wildlife management, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 1(3-4), Oct. 1937, pp. 100-105, 3 pls.

Use of aerial map as a base, outlining landmarks, preparation of grid of orientation lines; suggestion of symbols for cover mapping; all stages illustrated.

Ecology: Overpopulation, deer in Minnesota

Manweiler, J. Minnesota's deer problem, Minnesota Conservationist (Dept. of Conservation, St. Paul, Minn., 15 cents a copy), 50, Oct. 1937, pp. 7, 20-23, 31, 1 photo.

Description of deer habitat on large areas in northern Minnesota under management by the Farm Security Administration. After lumbering operations, deer increased greatly in numbers and finally greatly depleted their winter food. In a single winter 52 animals were found dead or dying in the yards, and during one hunting season hunters reported finding 132 dead deer. The author concludes from the data available that there is: "(1) An overstocked deer population, as indicated by deer drives, observations, and the extremely high kill ratio, (2) that the stock is of the older age class, (3) that males are excessive (this conclusion is not drawn from kill data alone), (4) that summer environment is ideal, (5) that winter food and climatic conditions are the chief limiting factors, (6) that a high percentage of winter kill is of the fawn and one and one-half year age class, (7) that the stock is vigorous, and (8) that predation is negligible where sufficient food is available. There is need for more flexible game laws permitting regulated open seasons at such times and places as will reduce the deer population to the carrying capacity of the range."

Ecology: Photoperiodism

Bissonnette, T. H. Photoperiodicity in birds, The Wilson Bulletin (Sioux City, Iowa, 60 cents a copy), 49(4), Dec. 1937, pp. 241-270.

Summarizing the results of papers cited in a closely-set six-page bibliography, this is another of Professor Bissonnette's papers that is so condensed it is practically an abstract. Daily rhythms are cited for temperature and general activity of birds, mitosis of their sex-cells, and for phases of their blood parasites. Seasonal rhythms are described as affecting temperatures, basal metabolism, thyroid activity, as well as numbers, migrations, plumage, and sexual activity. The sections, of about equal length, devoted to the last two topics compose the bulk of the paper.

Ecology: Population trends, fur animal

Atwood, Earl L., Jr. Results of the Clark National Forest fur-bearer survey, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 2(1), Jan. 1938, pp. 20-26, 2 graphs, 5 tables.

Conclusions drawn from a special inquiry among trappers in this forest taken in conjunction with the results of Bennitt and Nagel (Univ. Mo. Studies, 12(2), 1937. See WILDLIFE REVIEW, No. 9, July 1937, p. 12). A table shows the number and percentage of pelts taken and prices received for 10 species in 1936-37. Record of the wolves caught by a single trapper 1918-37 indicates an increase in recent years. The main object of the paper is to show population trends. From the author's summary we learn that, "(1) All fur bearers in the Clark National Forest, with the exception of wolf and gray fox, have shown a sharp decrease in numbers from 1932 to 1937; (2) the decrease in muskrat, mink, and raccoon during this period has been so rapid that all indications point to their being extirpated within a very few years if present decimating factors continue; (3) the decrease in skunk and opossum during the 1932-37 period has been much more rapid than during the 1924-32 period, indicating that these fur bearers have been reduced to the point where the numbers will decrease at an increasing rate which may result in five years, in their being in the present plight of the mink and muskrat, if present trends continue; (4) the red fox and wildcat have shown a slight decrease in numbers during 1932-36, though they can still be classed as common; (5) wolves and gray foxes have shown a slight increase since 1932. Available information indicates there are more of these animals than at any time during the past twenty years; (6) at present, the opossum is the most important in point of total numbers trapped and in total value of the pelts."

Ecology: Populations, big game on national forests

Anon. Estimate of big game animals on national forests, U. S. Forest Service (Washington, D.C.), 6 sheets, multigraphed, 1937.

The 1936 edition of a census that was begun in 1924. The big game population reported, totalling 1,684,133 animals, represents a net increase of some

140 percent in that period. Figures are given for the national forests by Regions and are summarized also by Regions and by States. The groups tabulated are antelope, bear, deer, elk, moose, mountain goat, and mountain sheep. A mimeographed covering letter of 3 pages, dated August 12, 1937, gives some supplementary information.

Ecology: Populations, brant in California

[Moffitt, James] Black brant population smaller, census reveals, California Conservationist (State Dept. of Natural Resources, Sacramento, Calif., 15 cents a copy), 2(11), Nov. 1937, p. 6.

Figures for 7 localities, during the period 1932-37, show totals varying from 13,819 to 135,153, the lowest in 1933, the highest in 1935; the 1937 count was 32,187.

Ecology: Populations, fur animals on national forests

Anon. Estimate of fur-bearing animals on national forests, U. S. Forest Service (Washington, D. C.), 1 sheet, multigraphed, 1937.

These estimates for the years 1935 and 1936 cover badger, beaver, fox, marten, mink, muskrat, otter, raccoon, skunk, weasel, and miscellaneous, and are totalled by species and by States. The grand totals for all groups, excluding miscellaneous, are for 1935, 1,440,109, and for 1936, 1,553,796. "Miscellaneous" were not tabulated for 1935 but for 1936 total 81,275.

Ecology: Populations, Ohio birds

Chapman, Floyd B. A quantitative study of the breeding birds of Nile Township, Scioto County, Ohio, Ohio Wildlife Research Station Release (Ohio State University, Columbus, Ohio) 40, 13 pp., 1 table, mimeographed, Oct. 1937.

Description of the area and of methods employed in the study; annotated list of breeding birds; list of these birds in order of abundance, 1936 and 1937; reprint of a paper by Chapman and Lawrence E. Hicks on a related subject from Bird-Lore (39, 1937, p. 379). The most significant point for wildlife technicians, perhaps, is that for population density--2.68 pairs of birds to the acre.

Ecology: Salt marshes of Louisiana

Penfound, Wm. T., and Edward S. Hathaway. Plant communities in the marshlands of southeastern Louisiana, Ecological Monographs (Duke University Press, Durham, N. C., $1.50 a copy), 8(1), Jan. 1938, pp. 1-56, 17 figs., 12 tables.

An ecological contribution of the first class. Related previous literature is reviewed and cited in a bibliography of 24 titles. Climate and physiographic conditions and the methods of the investigation are described. The vegetation of transects of representative areas is listed in tables giving in percentage the salinity of the soil water where the plants were collected. Of most value to wildlife managers, perhaps, is the full discussion of salinity as a factor in plant distribution. Most species have a wide range of salt tolerance, the range being least for those of lowest tolerance. In the probable order of salt tolerance the major marsh dominants are saw-grass, giant bulrush, broad-leaved cattail, narrow-leaved cattail, couch grass (Spartina patens), black rush, salt cane (Spartina alterniflora), and salt grass. Among biotic factors, man and muskrats are important; their roles are described. Further drainage of the marshes is considered undesirable.

Economics: Utility of native rabbit skins

Kellogg, Chas. E. Utility of jack rabbit and cottontail skins, U.S. Dept. Agr. Misc. Publ. (Superintendent of Documents, Washington, D.C., 5 cents a copy) 289, 7 pp., 4 tables, Nov. 1937.

Author's summary: This "study has revealed the possibilities of greater utilization of western wild-rabbit skins by hat manufacturers. As jack rabbits of the Midwest and the far West are likely to be considered a pest, any returns from the sale of skins will offset part at least of the expense of control. The price received will be the primary incentive for collecting the skins. This, however, will be largely determined by competing prices of the Australian rabbitskins and of those of the hutch-raised rabbits produced primarily for meat in this and other countries.

"At present the only outlet for wild-rabbit skins collected in the United States seems to be through the hatters' trade. They are not at all suitable for furriers' purposes. On the other hand, the better grade of skins from hutch-raised rabbits find their way into the fur trade because of their superior quality and the higher prices they command there."

Economics: Value of beaver dams

Scheffer, Paul M. The beaver as an upstream engineer, Soil Conservation (Superintendent of Documents, Washington, D. C., 10 cents a copy), Jan. 1938, pp. 178-181, 8 photos, 1 table.

Beaver meadows of value in relation to agronomy and forestry. Successful use of transplanted beavers in control of flood and water losses in certain valleys in Washington. The cost of beaver dams and of water storage by them is very low contrasted to that of engineering procedure.

Education: Ornithology

Baerg, W. J. Elementary ornithology (Published and copyright by the author, University of Arkansas, Fayetteville, Ark.), 70 pp., mimeographed, 1937.

Prepared for his classes, this introduction to ornithology by Professor Baerg may well have wider usage. The historical sketch mainly concerns persons who have contributed significantly either to world, American, or Arkansas ornithology. There is a brief account of fossil, recently extinct, and rare birds, and a synopsis of the relationships between birds and reptiles. The general distribution, classification, and economic value of birds are subjects of further sections of the work, and anatomy, colors and their uses, plumage and moulting, senses, song and other music, breeding habits, flight, and migration are considered. Birds and their haunts, including inter-relationships such as those brought about by cowbirds, English sparrows, and starlings; bird-banding, game birds, study topics, and questions for review also are treated. Many of the sections include references to literature for supplementary study.

Food Habits: Barred owl

Errington, Paul L., and Malcolm McDonald. Conclusions as to the food habits of the barred owl in Iowa, Iowa Bird Life (Winthrop, Iowa, 15 cents a copy), 7(4), Dec. 1937, pp. 47-49.

Study of the food from pellets is complicated by mixture of those of the great horned owl. Eliminating as nearly all of the latter as possible, the authors report on 305 pellets illustrative of the food of Iowa barred owls chiefly in fall, winter, and spring. The diet by seasons is described; preferences seen of little, availability of prey, of much, importance. The study of the barred owl adds to the evidence that a vast amount of predation is of neutral significance as concerns determination of population levels of prey.

Food Habits: Birds and lizards vs. beet leafhopper

Knowlton, George F. Biological control of the beet leafhopper in Utah, Utah Acad. Sci. Arts and Letters (Vasco M. Tanner, Brigham Young University, Provo, Utah), 14, 1937, pp. 111-140, 7 figs., 9 tables.

The beet leafhopper (Eutettix tenella) is a major agricultural pest in Utah. In this discussion of its biological control, lizards and birds are prominently mentioned. Comprehensive information is given on the food of Uta s. stansburiana; beet leafhoppers occurred in 2,249 out 4,021 stomachs. It is calculated that in one thoroughly studied area these lizards were annually consuming the leafhoppers to the extent of 264,364 per acre. Seven other species of lizards though known to feed on beet leafhoppers are of less importance. Twenty-two species of birds were found to feed on this destructive insect, their most effective work being done during fall migration. Bibliography of 31 titles.

Food Habits: Birds, Utah

Knowlton, George F. Utah birds in control of certain insect pests, Utah Acad. Sci. Arts and Letters (Vasco M. Tanner, Brigham Young University, Provo, Utah), 14, 1937, pp. 159-166, 1 pl.

Enumeration of food items found in the stomachs of 51 native, 2 introduced, and 2 domesticated species of birds, with special note and illustration relating to destruction of grasshoppers by California gulls. From author's summary, "Birds consume large quantities of injurious insects every season in Utah, compensating many times over for the moderate injury caused by a few of the species. The eating of large quantities of beet leafhoppers, false chinch bugs, ants, injurious species of pentatomids, alfalfa weevils and leaf bugs, as well as the consuming of injurious rodents, is decidedly helpful to the farmers and substantially reduces injury upon large areas of range grazing land in Utah."

Food Habits: Black bear depredations

Grimmer, W. F. The 1937 bear season, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison, Wis.) 11(10), Oct. 1937, pp. 4-6.

"For some unknown reason the black bear of northern Wisconsin appears to be on a rampage." Instances are given of destruction of a heifer, sheep, hogs, bees, corn, apples and apple trees, and other property. It was necessary for the Conservation Department to give 25 special permits to kill bears and to declare an open season in 19 counties.

Food Habits: Browsing by cottontail and deer

Ostrom, C. E. Where do deer and rabbits feed?, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 8(8), Nov. 1907, pp. 15, 30.

Studies on the Allegheny National Forest showed that both deer and rabbits browsed scarcely any under mature forest growth although a good understory is present. The degree (in percentage) to which these animals browsed shrubs and small trees on different sites is shown in the following table.

	Old growth	Second growth (north slope)	Second growth (plateau)	Open
Deer	0.1	47	26	20
Rabbits	1.0	6	15	23

Preferences among small trees of a few species are indicated by the subjoined percentages of browsing.

	Hemlock	Red maple	Black cherry	Sugar maple	Beech
Deer	29	29	26	20	13
Rabbits	3	47	9	21	23

Food Habits: Cooper's hawk

Vaughn, Ernest A. Wildlife's public enemy No. 1, Maryland Conservationist (512 Munsey Bldg., Baltimore, Md., 25 cents a copy), 14(4), Fall 1937, pp. 19-20, 1 photo.

List of food brought to their confined young by a pair of Cooper's hawks in Worcester County, Md.: Young chickens 10, yellow-throated warblers 2, robin 1, young bluebird 1, catbirds 2, blackbird 1, song sparrows 2, towhee 1, cardinals 2; ground squirrels 2, gray squirrel 1, flying squirrel 1, unidentified rodent 1, young rabbits 9, kitten 1. No evidence of bobwhite was found. The author refers to hundreds of similar tragedies, but that does not seem to be the correct word for a phase of the natural working out of population problems.

Food Habits: Deer browse, Adirondack

Pearce, John. The effect of deer browsing on certain western Adirondack forest types, Roosevelt Wild Life Bul. (College of Forestry, Syracuse, N. Y.), 7(1), Oct. 1937, 61 pp., 25 figs., 6 tables, 1 map.

Browsing is intensified in fall as herbaceous plants wither and in periods of deep snow is restricted to areas, termed "yards", the temporary ranges of deer herds. Deer manifest a strong desire to remain on a definite range even when others easily accessible apparently have better feed. This leads to overbrowsing, particularly in yards. Ordinary browsing is, however, light and widely distributed. Local preferences among kinds of browse and possible reasons for them are discussed but the deer were found to feed on practically every woody plant except spruce. Methods of tallying vegetation and the evidences of browsing, and of distinguishing deer and rabbit browsing are described. Red maple, yellow birch, mountain holly, and witch hobble have special appeal to deer in the region; and the appearance of the last-named is the best indication of the general degree of browsing in old growth. The report is written from the forestry point of view but there is much in it, especially as to preferred browse and degree of utilization, that is of value to the wildlife manager. Bibliography of 74 titles.

Food Habits: Montana birds

Mills, Harlow B. Some Montana birds, their relationship to insects and rodents, Montana Agr. Expt. Sta. Circ. (Bozeman), 151, 48 pp., 20 figs., Sept. 1937.

A chiefly compiled account dealing mostly with the economic relations of raptorial and fish-eating birds; swans, cranes, magpie, and crow also are discussed. Bibliography of 30 titles.

Food Habits: Skunk

Allen, Durward L. The skunk: a boon or pest?, Michigan Conservation (Dept. of Conservation, Lansing, Mich.), 7(4), Dec. 1937, pp. 3, 9-10, 1 photo.

Good introductory statement on predation from which one sentence is: "A fox eating a rabbit is no more vicious than a cow munching away in a clover field." A study on an area where several thousand chickens were reared, and

skunks were abundant, revealed that the animals got mainly dead or diseased birds--a conceivably useful activity. Killing of healthy chickens by skunks is regarded as exceptional. The sound policy is to manage the chickens so that skunks cannot get them rather than to combat the skunks. Hive bees are sometimes molested but can be protected by elevating the hives 2 feet above the ground. Skunks are destructive to the eggs of ground-nesting birds and in a heavily populated 500-acre tract were found to have eaten about 10 percent of the eggs of wild ducks. On the other hand skunks feed extensively upon insects, including white grubs, cutworms, grasshoppers, crickets, and other injurious kinds. Perhaps the greatest service that the skunk renders the farmer is in the destruction of mice and rats. Quotations are given from several authors as to the predominantly useful food habits of skunks. The author concludes that in general the skunk is highly valuable to agricultural interests. When control, other than trapping for fur, is needed, it is best accomplished by destruction of a sufficient number of females, a practicable procedure as the females were found to congregate in winter burrows.

Food Habits: Skunks

Selko, Lyle F. Food habits of Iowa skunks in the fall of 1936, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 1(3-4), Oct. 1937, pp. 70-76, 2 tables.

Reports on analyses by both the volumetric and frequency methods of scats of Mephitis and Spilogale. The material was not abundant enough to conceal the effect of certain adventitious factors, but it would appear safe to say that among natural foods for the period involved, striped skunks depended most heavily upon grasshoppers and spotted skunks upon meadow mice. White grubs and crickets were readily eaten by both species.

Food Habits: White-tailed deer

Davenport, L. A. Find deer have marked food preferences, Michigan Conservation (Dept. of Conservation, Lansing, Mich.), 7(4), Dec. 1937, pp. 4-6, 11, 2 photos, 1 table.

In controlled feeding experiments, white cedar proved to be the only kind of browse upon which, when fed exclusively, the deer could maintain their strength. The average consumption of this satisfactory browse was 4-1/2 lbs. per day. Less nutritious foods and feed mixtures were consumed in larger quantities proportional to their deficiencies. The kinds of browse found fairly satisfactory in mixtures included: white cedar, white spruce, balsam fir, jack pine, hard maple, soft maple, poplar, basswood, scrub oak, black ash, yellow birch, and American elm. Timothy and cracked corn also proved to be a sustaining diet but there was great wastage of the hay, and the grain had to be fed with care to prevent overeating. Soy-bean meal, dried skim milk, and codliver oil were accepted as supplementary diet, but a number of other things were rejected, including a special mineral mixture. Browse-plot studies led to the conclusion that the carrying capacity of good cedar deer yards should be from 3 to 4 animals to the acre. A table (with 10 headings) of chemical analyses of 15 sorts of browse is presented. The protein content was highest

in alder (9.79) and lowest in scrub oak (5.20), all below what is considered a desirable proportion (12 percent) for domestic livestock. Seasonal variations in diet are marked and coincide in the main with changes in availability. The studies are being continued.

Life Histories: Baird's sparrow

Cartwright, B. W., T. M. Shortt, and R. D. Harris. Baird's sparrow, Royal Canadian Inst. Trans. (Ontario Museum of Zoology, Toronto, Canada), 21(2), 1937, pp. 153-197, Pl. 16, 1 fig., 7 tables.

History of knowledge of the species, Ammodramus bairdii; account of its range and migrations; field identification marks; courtship and mating; habitat and territory; nests and nesting; plumages; food and feeding of young; voice; and parasitism by cowbirds. There is a list of specimens in museums, another of actual breeding records, and a copious bibliography.

Life Histories: Bobwhite

Bogle, M. E. Bobwhite history (Author, 105 Routt St., San Antonio, Texas, $1.00 a copy), 47 pp., illus., 1938.

Although a commercial publication, a high proportion of its pages is devoted to life history topics, the more interesting and valuable because they are not wholly compiled but incorporate knowledge gained by the author in his extended experience as hunter and dealer. The varieties of bobwhite are described, and their ranges and weights plotted on an original map. General habits, food, and range requirements are discussed; the author gives evidence from personal experience that under the most favorable conditions a population as high as 7 birds per acre may be maintained. Surface water is not necessary for bobwhites but their dew consumption and other water requirements restrict them to fairly humid regions. Breeding phenomena, limitations on increase, life expectancy, and sex ratio are fairly discussed. The account of the farmer-sportsman relationship and the possibility of cash returns for shooting rights also is unexceptionable. The history of importation of Mexican quail, methods of shipment, and related topics are treated by one who certainly knows what it is all about. As to the value of such stocking, opinions differ and the viewpoint of the author is, of course, that of the dealer.

Life Histories: Canada goose

Williams, Cecil S., and William H. Marshall. Goose nesting studies on Bear River Migratory Waterfowl Refuge, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 1(3-4), pp. 77-86, 4 figs., 3 pls., 1 table, Oct. 1937.

Description of the habitat accompanied by a graph showing percentages of cover provided by 5 groups of plants. Nesting period and habits, proximity of observer to nests before sitting birds flushed. Ecological factors affecting nesting of which a firm foundation often provided by muskrat structures seems of most importance. Egg production and hatch (81 percent average); egg losses and their causes. Management suggestions.

Life Histories: Canada goose gosling survival

Williams, Cecil S., and William H. Marshall. Survival of Canada goose goslings, Bear River Refuge, Utah, 1937, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D.C., 75 cents a copy), 2(1), Jan. 1938, pp. 17-19, 1 table.

Counts of 2,599 broods showed an average size of 4.87 in May and 4.73 in June, mortality in this stage, therefore, being negligible. Notes on habits.

Life Histories: Fur animals, Mississippi

Yeager, Lee E. Some habits of southern fur-bearers as indicated by trapping, American Midland Naturalist (University of Notre Dame, Notre Dame, Ind., 50 cents a copy), 18(6), Nov. 1937, pp. 1072-1078, 6 tables.

Further results of the study reported on in the Journal of Wildlife Management, 1(1-2), July 1937, pp. 28-36, which was abstracted in WILDLIFE REVIEW, No. 9, July 1937, p. 27. The catch in 5 years of trapping on a Mississippi farm is analyzed as to sex, site where trapped (land or water), whether with baited or unbaited traps, attraction by different kinds of bait, the prevalence of log-walking, and the proportion drowned in water sets.

Life Histories: Microtus, growth and longevity

Hamilton, W. J., Jr. Growth and life span of the field mouse, Amer. Nat. (Science Press, Lancaster, Pa., $1.00 a copy), 71(736), Sept.-Oct. 1937, pp. 500-507, 4 figs. (graphs).

Weight (over 25 grams) a good index of sexual maturity; birth weights; growth rate; distribution of weights of trapped specimens by months; length of life, a year, more or less; activity and longevity compared to those of Peromyscus and Rattus. Three factors which appear to operate in causing a short life span in the field mouse are (a) attainment of sexual maturity at an uncommonly early age, (b) extreme prolificness, and (c) little cessation of activity.

Life Histories: Porcupine

Dale, Bonnycastle, Jr. Porky lore, Rod and Gun in Canada (1124 St. Catherine St., Montreal, Canada, 10 cents a copy), 39(6), Nov. 1937, pp. 15-16, 33-34, 3 photos.

After fights the animals pull out with their paws quills received from adversaries; description of their fighting. Notes on food; inner bark of pine, spruce, hemlock, larch, oak, beech, birch, and others. Upon opportunity they destroy fruit trees and gnaw salty objects as axe handles, pickle barrels, and harness. Control necessary about backwoods settlements but not in the forest. Bounty payments invite fraud. Notes on mating, number and care of young, and their rapid growth.

Life Histories: Sex ratio of muskrat

Marshall, William H. Muskrat sex ratios in Utah, Journ. Mammalogy (Wm. H. Burt, University Museum, Ann Arbor, Mich., $1.00 a copy), 18(4), Nov. 1937, pp. 518-159.

From author's summary: "1. Intensive trapping in the fall resulted in a sex-ratio of 48 males to 52 females in a sample of 1,065 muskrats. Intensive trapping in the spring in the same areas, resulted in a sex-ratio of 60.5 males to 39.5 females in a sample of 491 muskrats."

Life Histories: Sharp-tailed grouse

Marshall, William H., and Max S. Jensen. Winter and spring studies of the sharp-tailed grouse in Utah, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 1(3-4), Oct. 1937, pp. 87-99, 4 figs., 1 pl., 3 tables.

Present range and numbers; vegetation of areas supporting the grouse and its relation to their activities; effects of other environmental factors; habits of the birds; food preferences; relation to other animals and to man.

Life Histories: Song sparrow

Nice, Margaret M. Studies in the life history of the song sparrow, I, Linn. Soc. N. Y. Trans. (Linnaean Society of New York, c/o American Museum of Natural History, New York, N. Y., $1.50 a copy), 4, 247 pp., 3 pls., 18 charts, 33 tables, April 1937.

Many compliments have been paid this work but among them has not been seen the very obvious one that it shows what can be done by a single worker, at home, without elaborate equipment, and at small expense. No wealthy "angel", no outburst of publicity, and no great expedition were required but the product is a model contribution to basic research on animal populations. The report is a partial one on 8 years' work at Columbus, Ohio, on one of the most common birds. The study was very detailed but the report is thoroughly organized and each chapter of it is summarized so that a very good idea of its contents may be had merely by scanning the summaries. From these are gleaned various remarks that illustrate the significance of the work to applied ecology. Fifteen external parasites, 7 avian and 8 mammalian predators are enumerated; "the cat and Norway rat are considered the worst enemies of song sparrows." In this migratory species, the sex ratio varies, the preponderance of males being highest during the winter. Migration is dependent on both increasing day-length and rising temperature. Temperature, precipitation, availability of food, state of nesting grounds--all are shown to influence the start of nesting. The average percentage of hatch for all eggs observed during 6 years was 60, and of fledglings from all eggs, 36. Percentages of the eggs lost according to causes were: flood 2.9, predators 36.4, cowbird 6, infertility 5.7, desertion 2.4, man's activities 3.7, and death of parents 4. A substantial proportion of the young return to the place of birth. About 12 percent of the young hatched survive to breed. The holding of territory is a fundamental trait.

Some of the conclusions bearing on more theoretical matters also may well be cited. "Females do not appear to prefer the larger, handsomer, stronger males, nor do they choose the best equipped territories." "Evidence for the inheritance of color, shape, and size of eggs is negative." A review of the subject for birds reveals that, "Inbreeding in the wild apparently has been proved in only three instances." "It is believed that this Song Sparrow population illustrates Errington's principle that a well-situated population is almost immune to predation, but that an exposed one suffers heavy losses, so that survival is 'largely determined by the carrying capacity of the land.'" The self-limiting tendency of animal populations emphasized by McAtee is recognized, especially in the territorial behavior of the birds. The song sparrow does not allow itself to be crowded. The author justly remarks that theorizing has outrun its factual basis but points out that for this very reason efforts should be redoubled to accumulate the needed facts. Perhaps when we have them, conclusions will be evident, theories unnecessary. The work is a mine of information and had we something like it for all of the common species, we would be fortunate indeed.

Management: Allegany State Park, N. Y.

Gordon, R. B. The relation of vegetational surveys to a State Park management policy, New York State Museum Handbook (State Museum, Albany, N. Y., $1.00 a copy) 17, pp. 329-382, figs. 193-216, 1937.

This section of a 400-page handbook presents the views of the man who, more than any other, had to do with surveying the area and compiling the report upon it. The theme of the chapter abstracted is "that any management policy based on technical and scientific information should prove more substantial than one which may be based mainly on general opinions, guesses, or traditional procedures" (p. 332). The application of the results of the vegetational survey to various features of park management is suggested. The recommendations affecting wildlife relate mainly to the setting aside of natural history preserves, game sanctuaries, and game development areas where hunting and fishing should be permitted. There is a sectional bibliography of 27 titles.

Management: Allegany State Park, N. Y.

Saunders, Aretas A. Suggestions concerning policies for the Allegany State Park, New York State Museum Handbook (State Museum, Albany, N. Y., $1.00 a copy), 17, pp. 383-398, 1937.

The purposes of the park are recreational, educational, scientific, and economic, those of the last category, however, being subordinate. The value of wildlife in the furtherance of these objects and how to preserve it for that use are the main contributions of this chapter.

Management: Burning

Conklin, W. Gard. Are game habitats improved by burning?, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 8(10), Jan. 1938, p. 30.

Comparison of the kill on a regularly burned forest acreage with that on another of like extent, but with fewer fires, is heavily in favor of the latter and the conclusion is drawn that the burned over region is lacking in quantity and quality of food and cover. Comment: It must not be forgotten that the effects of burning may differ from region to region, and that determining what they are is not to be done in an offhand manner. The researches of S. W. Greene in Mississippi, referred to in previous issues of WILDLIFE REVIEW (No. 1, September 1935, p. 12; No. 4, June 1936, p. 13), show that the relations of fire to environment are very complicated and anything but easy to appraise.

Management: Dispersing deer concentrations

Cox, W. T. Preventing deer concentrations, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 2(1), January 1938, pp. 1-2.

Planting to assure better interspersion of cover and food supplies; driving or luring deer from overstocked yards.

Management: Farm game in Carolina piedmont

Stevens, Ross O. Wildlife conservation through erosion control in the piedmont, U. S. Dept. Agr. Farmers' Bul. (Supt. of Documents, Washington, D. C., 5 cents a copy) 1788, 25 pp., 20 figs., tables, 1937.

Though numerous devices are employed to control erosion, a complete job is done only by the use of plant cover. Many plants of value for erosion control supply food and cover for wildlife. Hence erosion control and wildlife conservation go well together. This welcome bulletin tells what has been done jointly to further these interests on farms in the Carolina piedmont, and gives them graphic significance by well selected illustrations. General headings in the publication are: conservation on cultivated fields, dedicating eroded areas to wildlife, the wildlife crop, shrubs for erosion control and wildlife use, seed-producing annuals and perennials, and sportsmanship on farms. The section devoted to erosion control practices treats gullies and gall-spots, terrace outlets and waterways, field borders, retired lands, and pastures. The lists of shrubs and of annual plants for use on various sites should be very helpful. All in all this is the most practical publication on wildlife management the Government has issued.

Management: Farmer-sportsman relationship

Chalk, John D., and Ross O. Stevens. Cooperative farm game program (Dept. of Conservation and Development, Raleigh, N. C.), 8 pp., 1937.

Plans for 5-year sanctuaries, temporary sanctuaries, and regulated hunting, by which it is hoped to: "(1) Conserve and promote the interests of wildlife and related resources in general with due regard to all values and all groups of people; (2) increase the supply of game birds and other game animals and thereby in the long run increase the amount of hunting which will be possible; (3) increase the amount of satisfactory hunting range; and (4) bring about more orderly hunting to the mutual benefit of land owners, sportsmen, and nature lovers."

Management: Farmer-sportsman relationship

Conklin, W. Gard. A review of the farm-game refuge program, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 8(10), Jan. 1938, pp. 14-17, 31, 7 photos (one an aerial map).

Record of accomplishments in number of projects, legal agreements, refuges, and safety zones; in a little more than a year the movement was extended to some 40,000 acres in 17 counties. More than a hundred each of both farmers and sportsmen were interviewed in order to get information on the working of the plan and suggestions for improvement. What the farmers seemed to want most was protection. It is considered that the arrangement has worked satisfactorily on the whole, and that it probably will be extended.

Management: Forest management in relation to wildlife

Curtis, James D., and R. E. Trippensee. A proposed study of timber and wildlife production in central New England, Journ. Forestry (Mills Bldg., Washington, D.C., 50 cents a copy), 35(12), Dec. 1937, pp. 1111-1115, 2 photos.

Suggestions as to interrelations of wildlife and the forest; description of area (Mt. Toby Forest, Mass.) selected for the investigation, including notes on available equipment and mention of the more common trees and animals. Part of the authors' abstract is: "Of all combinations of land-use, few fit so many conditions as timber and wildlife production. The demand for both is widespread and, interpreted in a literal sense, both are vital to perhaps a larger proportion of people than any other two forest products. That this demand in some form or another is likely to increase is inevitable and when it does the need of combined management of both resources will be justified more than ever before. Massachusetts State College, along with a considerable number of other research institutions, has undertaken a long time study of this problem.

Management: Fur seal

Bower, Ward T. Alaska fishery and fur-seal industries in 1936, U. S. Bureau of Fisheries Administrative Rep. (Superintendent of Documents, Washington, D. C., 10 cents a copy), 28, pp. 279-347, numerous tables, 1938.

Discussion of the fur-seal industry occupies pp. 326-347. Intercalated is information on artic foxes, sea-otter, and reindeer, and on pp. 322-323 is a brief statement about whaling in 1936. The seal herd has been steadily

increasing under management and in 1936 was estimated to include nearly 1,700,000 individuals. Of these 52,446 were killed and the skins of 42,239 of them were sold for a gross sum of $1,192,172. A special paper "Computation of fur seals, Pribilof Islands, 1936" by Harry J. Christoffers contains data on the make-up of the herds by sexes, age classes, and harems, and makes recommendations for changes in management and harvesting.

Management: General

LeCompte, E. Lee. Conservation plan for wildlife, Maryland Conservationist (512 Munsey Bldg., Baltimore, Md., 25 cents a copy), 14(4), Fall 1937, pp. 5-8, 6 photos.

Suggestions as to many aspects of game management including protection and maintenance of cover, control of grazing and fire, provision of water, and production of food by planting suitable trees and shrubs.

Management: Harvesting, deer kill, California

Anon. California's eleven-year deer harvest by counties, California Conservationist (State Dept. of Natural Resources, Sacramento, Calif., 15 cents a copy), 2(11), Nov. 1937, p. 5.

Tabulation; the reported kill from 1927 to 1937, inclusive, varied from 17,686 to 31,890. In a supplement entitled "Final 1937 deer kill is tabulated" (same journal, 2(12), Dec. 1937, p. 23) the 1937 figures are given as 32,211 and the average for the years 1927-36 as 21,564.

Management: Harvesting quail

Denmead, Talbott. Maryland quail records, Maryland Conservationist (512 Munsey Building, Baltimore, Md., 25 cents a copy), 14(4), Fall 1937, pp. 18-19, 1 photo, 1 table.

Number of quail taken annually from 1904-36 (5 years omitted) over a certain territory in Dorchester County, Md., by a group of 2-5 hunters. The totals vary from 16 to 146, and the average number of quail to a hunter per day from 1.77 to 11.5. The record shows also the total bags of woodcock and jacksnipe. This article is of further value as embodying the findings of Dr. Alexander Wetmore as to the results of stocking with Mexican quail. Of 92 birds examined, only one appeared to be of pure Mexican stock; it was Dr. Wetmore's opinion that the introductions had not been successful. For a number of years the released Mexican quail were banded but only one banded specimen was recovered. There are other interesting observations by the writer on conditions and incidents of the period.

Management: Herd control

Avery, Ben. Birth control on the Kaibab, Arizona Wildlife Magazine (32 W. Jefferson St., Phoenix, Ariz., 25 cents a copy), 7(7), Nov.-Dec. 1937, pp. 5, 13, 1 photo.

"Herd control on the Kaibab" would have been a better title for this article which brings welcome news of a generally little understood situation. The Kaibab deer overpopulation and its effect on the environment is an old story but many probably do not realize that the herd has been in process of reduction for 13 years. To provide more game for hunters, the numbers of mountain lions and coyotes on the area are being kept down. "Extermination of neither is proposed though it is hoped to keep them to a low number." In 1937, 1,465 deer were killed and the remaining herd estimated at about 16,000. The animals now keep in good condition and officials believe the time has come to halt the reducing process. Shortening the season in 1937 did not reduce the kill to the desired extent so other measures may be required. Statistics are given on the number of bucks killed in 1937 according to the antler-point classes. The heaviest weighed 247 pounds; the widest spread of antlers was 42 inches. Formulas are presented for determining age of deer by tooth characteristics.

Management: Herd reduction

MacKenzie, H. W. To the citizens of Wisconsin interested in deer, Wisconsin Conservationist (Wisconsin Conservation Dept., Madison, Wis.), 2(9), Sept. 1937, pp. 3-9.

Deer have been increasing and their food supply decreasing so that there has been damage to forests and to the animals' habitat. Recommendations for liberalization of the open season were accepted by 61 counties. In 1936 about 30,000 deer were killed. A brief article immediately following the preceding quotes from a letter to the effect that in recent years deer have been 10 or more times as abundant as they were 50 years ago--a result the writer, an old-time hunter, attributes, in part at least, to the killing off of wolves.

Management: Miscellaneous

Anon. Wildlife management in North Carolina (Division of Game and Inland Fisheries, Raleigh, N. C.), 16 pp., Jan. 1938.

Interesting brief accounts of a variety of topics. Two are the relation of birds to boll-weevils and to chinch bugs; quail are given credit for cleaning up an infestation in oats near Wadesboro, N. C. In a feeding experiment with captive quail, it was found that the birds took privet berries readily and did not lose weight appreciably when given nothing else for a week. Two instances are cited of increasing the squirrel population by providing shelter logs and boxes together with some winter feeding. [In one case 200 squirrels are said to be inhabiting "a few acres"; it would be of interest to learn what the effect is on the bird population.] Food patches of lespedeza and fruit-producing shrubs are freely utilized; annual crop plants, including Brabham and Iron cowpeas, Laredo soybeans, Mung beans, German and Browntop millet, and Kafir corn, also are valuable. Notes are given on the North Carolina farm game program, on the reasons for wildlife protection, and on winter feeding.

Management: Planting, black locust

Anon. Effect of depth of sowing on nursery yields of black locust, Southern Forestry Notes (Southern Forestry Expt. Sta., New Orleans, La.), 20, Jan. 1938, [p. 4].

Seeds covered 1/4 inch in silty clay and 1/4 and 1/2 inch in sandy soil, gave much higher yields than those buried deeper. "In order to insure uniform covering at such shallow depths, a careful adjustment and operation of mechanical seeders is required, as well as a thorough preparation and leveling of the seedbed prior to sowing."

Management: Planting, Nebraska

McComb, H. A. Trees, shrubs, and vines at the North Platte Experimental Substation, Agr. Expt. Sta. Bul. (Univ. of Nebraska, Lincoln) 310, 38 pp., 16 figs., 8 tables, July 1937.

Another of the very useful series of experiment station bulletins on hardiness of plants for difficult situations. This bulletin summarizes results of planting since 1907 for a locality where the average rainfall is just under 19 inches and wide variations in annual and seasonal precipitation characteristic. The temperature range is great and changes abrupt. The prevalence of high winds increases the difficulty of growing trees. Windbreaks are, therefore, given special attention but other functions of woody plants are not neglected. Hardiness, implying satisfactory resistance to all unfavorable local conditions, is fully described for all species treated. These number 27 groups of deciduous, and 20 of evergreen, trees, 30 of deciduous shrubs, and 7 of vines. There is also a complete list of plants of these categories that have been tried at the North Platte Substation with annotations as to hardiness.

Management: Planting for wildlife and erosion control

Harper, Frank B. Wide-row plantings of annuals, Soil Conservation (Superintendent of Documents, Washington, D. C., 10 cents a copy), 3(6), Dec. 1937, pp. 163-164, 3 photos.

Rows of corn, cane, Sudan grass, and sunflowers at intervals across fields cultivated for potatoes and other crops in North Dakota, to act as windbreaks, accumulate snow moisture and provide food and shelter for wildlife. Sunflowers used also parallel to tree and shrub windbreaks.

Management: Planting for wildlife, Lespedezas

Massey, A. B. Native food plants--the lespedezas, Virginia Wildlife (Blacksburg, Va.), 1(2), Oct. 1937, pp. 4-5.

Value of certain species of Lespedeza that resist snow blanketing for the supply of nutritious seeds thus kept available to wildlife through the winter. Lespedeza seeds "are high in protein, which is considered essential in conditioning birds for the breeding season."

Management: Planting for wildlife, woodland borders

Van Dersal, Wm. R. A border for the woods, Soil Conservation (Superintendent of Documents, Washington, D. C., 10 cents a copy), 3(4), Oct. 1937, pp. 99-101, 7 photos.

Shrub borders reduce undesirable effects of wind on woodlands, contribute to the natural pruning of trees, and are valuable to wildlife. Under the heads of small trees, tall shrubs, low shrubs, and vines, lists of fruit-bearing species are presented.

Management: Preserving quail breeding stock

Gorstell, Richard. Practical management of the bobwhite quail on the northern range, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 8(9), Dec. 1937, pp. 10-11, 28-29, 2 graphs.

A graph illustrates the effects of severe winters on the annual kill which was low following the seasons of 1917-18 and 1935-36. "Since the elimination of market hunting, major fluctuations in the quail population have been controlled, not by the kill of the hunters, nor by the effects of restocking programs, but by climatic conditions." Restocking has probably been the least effective of the Commission's quail management practices, and a banding campaign has been started to make possible more accurate appraisal of its results. In any event, winters of extreme severity cut down the quail population, however attained, and thus periodically offset the means of protection and increase that have been tried. It is suggested, therefore, that trapping large numbers of quail and holding them over winter, well-sheltered and well-fed, may be the most economical and effective means of assuring a satisfactory breeding stock. Bibliography of 6 titles.

Directions are given in an accompanying article on page 12 for trapping, holding, and liberating quail.

Management: Refuges

Anon. Game refuges on national forests--December 31, 1936, U. S. Forest Service (Washington, D. C.), 3 sheets, multigraphed, 1937.

A tabulation of State game refuges, Federal game refuges, and game areas administrative restriction, by Regions, States, and Forests. The information given is the number of refuges, their areas, the acreage grazed by livestock, numbers and classes of stock, and percentage of capacity used by livestock. There are summaries for Regions and States. The total number of State refuges is 349 covering some 21 million acres grazed by livestock to 58 percent of capacity; corresponding figures for Federal game refuges are: 31, 4 millions, and 19 percent; and for game areas by administrative restriction: 120, 4 millions, and 13 percent.

Management: Refuges, Beltrami and Pine Island areas, Minnesota

Griswold, Oliver. America's best wildlife refuge, Minnesota Conservationist (State Dept. of Conservation, St. Paul, Minn., 15 cents a copy), 51, Nov. 1937, pp. 12-13, 25, 3 photos.

Refers to the Beltrami and Pine Island projects of the Farm Security Administration together comprising one and a half million acres. About 340,000 acres have been reflooded by the building of 176 dams. Beaver and wild fowl have notably responded and forest fires have been sharply reduced in number. Elk have done well and caribou and moose will be aided as much as possible. Two hundred and fifty acres of feed patches have been seeded and 700 acres of reflooded land planted with suitable duck foods.

Management: Seed, acid treatment

Meginnis, H. G. Sulphuric acid treatment to increase germination of black locust seed, U. S. Dept. Agr. Circ. (Superintendent of Documents, Washington, D. C., 10 cents a copy) 453, 34 pp., 12 figs., 9 tables, Nov. 1937.

Mainly an account of experimental work; in field tests acid-treated seed produced from 1.7 to 14.6 times as many seedlings as did untreated seed and in extensive nursery sowings the gain was from 81 to 114 percent. The treatment costs from 2 to 5 cents a pound and is considered economical.

Management: Stocking muskrats.

Storer, Tracy I. The muskrat as native and alien, Journ. Mammalogy (Wm. H. Burt, University Museum, Ann Arbor, Mich., $1.00 a copy), 18(4), Nov. 1937, pp. 443-460, 1 pl., 2 figs.

Natural range of the muskrat in the United States and Canada; transplantations and their results both in America and Europe. A map shows the spread of descendants of a few pairs released in Czechoslovakia in 1907. European attempts at extirpation are described; in Great Britain they promise to be successful; in central Europe they are giving way to resignation to continued presence of the animals. The history of transplants into California is given in detail including efforts at regulation. A map shows the status of muskrats in the State in 1937. There are illustrations of 3 types of traps used in Europe and a bibliography of 19 titles.

Management: Stocking pheasants

Leopold, Aldo, Orville S. Lee, and Harry C. Anderson. Wisconsin pheasant movement study, 1936-37, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 2(1), Jan. 1938, pp. 3-12, 1 fig.

Technique of trapping, handling, and feather-marking pheasants for this study. Details of the movement and survival of released birds. Damage to corn and steps to prevent it. Analysis of pheasant weights by localities and

sexes. From author's summary: "Wild pheasants trapped in winter from managed refuges may be cheaper and better than artificial pheasants for replenishing understocked range. x x x Where food and cover were good and coverts of ample size, there was no dispersion. Where food was good but coverts small and scattered, the released birds held well in some instances. In others they (and also the resident birds) adopted a circuit type of ranging similar to that of the large carnivores. Where food and cover were both poor, dispersion was immediate and complete. x x x In general, the Ohio plan is admirably adapted to that transition period in which the farmer, while willing to help feed, is still inclined to let the state worry about winter cover. Under that plan the pheasants are wintered where cover happens to exist and then artificially redistributed so as to stock summer and fall range which would otherwise be vacant. This reduces spring congestion and crop damage. It is an artificial system but less so than the dependence on pen propagation toward which most states are steadily drifting."

Management: Winter feeding

Grange, Wallace B. Feeding wildlife in winter, U. S. Dept. Agr. Farmers' Bul. (Superintendent of Documents, Washington, D. C., 5 cents a copy) 1783, 20 pp., 9 figs., Nov. 1937.

This is a revision of Misc. Publ. 159, "Winter feeding of wildlife on northern farms," which it supersedes. The geographic scope is enlarged and mammals are given more attention than in the previous publication. The main heads are: need for winter feeding; feeding: upland game and other land birds, waterfowl, small mammals, and big game; and planning for the future. Feeding stations are described and illustrated, and feeds and methods of supplying them suggested. Interesting discussions under subheads include: organizing a winter feeding campaign, treatment of predators, natural winter foods and their shortage, range deterioration, and emergency feeding.

Management: Winter feeding

Hawkins, Arthur S. Winter feeding at Faville Grove, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 1(3-4), Oct. 1937, pp. 62-69, 5 tables.

Severity of winter in relation to bobwhite mortality and quantity of food consumed at feeding stations. Methods used in measuring consumption and palatability of feeds; obstacles to measurement. Palatability ratings for 1936 and 1937 compared and preferences of species discussed. Results for rabbits agreed very well with those for game birds. The feed budget and economizing with mixtures. Tests of several natural foods. Extracts from author's summary: "Corn was greatly preferred to any other grain tested. The acceptance ranking of seven other grains in 1937 was: scratch feed, buckwheat, wheat, oats, sorghum, wheatland milo, barley. In 1936 wheat, milo, and barley ranked higher. Spiking ears on a rack has fewer faults than other methods of feeding. Consumption per animal per week is: pheasant and squirrel, 2 pounds; prairie chicken and rabbit, 1.5 pounds; Hungarian partridge, 1 pound; quail, 0.5 pounds. Poison sumac, burdock, sticktights, dock, lamb's quarters, and pigweed are taken even with corn available."

Pollution problems in California

[Shaw, Paul A., and Charles L. Towers] Water pollution--what's being done about it?, California Conservationist (State Dept. of Natural Resources, Sacramento, Calif., 15 cents a copy), 2(11), Nov. 1937, pp. 1-2, 23.

Quotation of California law relating to pollution, discussion of the chief types of pollution encountered in the State, and of what is and can be done about it.

Predation

[Williamson, F. H. H. The problem of predation], Eastern Ontario Fish and Game Protective Assoc. Bul. (Gananoque, Ontario, Canada), 2(2), Oct. 1937, pp. 5-9.

Report by the Controller of the Canadian National Parks Bureau citing the effects on game herds of freedom from predators, and damage to habitat by uncontrolled herds. "Except for direct defense of domestic stock, the attitude of the public towards predators is based generally upon prejudice and lack of knowledge, and it is the duty of those who have studied the problem, even though they have not fathomed all its intricacies, to give to the public the benefit of the knowledge gained in the hope that a saner and more philosophical view will be accepted as more is learned of the facts presented by the biologists who are wrestling with the problem."

With regard to birds of prey, the recommendation is made that, "Game administrators should do everything that is possible to meet mistaken ideas about birds of prey and to discourage the killing of them. We cannot afford to do without the services of these birds in the killing of rodents, of which they are one of the most efficient natural checks. Even if some of the larger birds do prey upon game birds, it is not proven that they do harm, and on general principles it is quite probable they do good to the species upon which they prey."

Predation: Meaning of

Errington, Paul L. What is the meaning of predation?, Smithsonian Institution Report (Washington, D. C.) 1936, pp. 243-252, 2 tables, 1937.

It is gratifying to have this summary of the findings and philosophy of one who more than anyone else in recent years has been devoting time and thought to the problem of predation. Pointing out popular misconceptions, the author shows that they are due mainly to failure to distinguish between cause and effect. He reminds us, therefore, that predation is essentially a by-product of population rather than a dominant influence on population. Most of the text is devoted to an exposition of the concept of limited carrying capacity of environment as it has been developed by the author's work with quail in the Middle West. Population above carrying capacity is vulnerable and disappears in one way or another, whether as a result of predation or of other causes of mortality. The writer asserts that his paper "is not intended

to be a brief against all attempts to control predators for x x x legitimate purposes. x x x It does submit that predator control is frequently emphasized beyond any existing justification. Too often the persecution of predators--however futile--is the one thing that is stressed in the name of conservation, whereas measures of the utmost merit are barely toyed with, if not disregarded altogether. When predator control is only blind, ruthless suppression of any and all flesh-eaters, or alleged flesh-eaters, with no heed for the status of rare or endangered species, it surely ceases to be the public interest and should be discouraged the same as any other wasteful practice.

"The interrelationships of predation are exceedingly complex and variable, and how much they will ever be understood is problematical. The accumulating evidence seems to suggest that many prey populations are constituted to withstand far more pressure from enemies than they ordinarily get; and, within the restrictions imposed by their habitats, seem to be mainly self-limiting and self-adjusting in numbers. The impacts of predation, then, are absorbed by at least some populations that seem to be resilient chiefly according to their needs. The trimming down by predation of excess populations that must disappear, anyway, is incidental. It should not be regarded as a threat to the permanent nucleus, which, barring drastic change in environment, will continue to occupy all livable quarters and produce the usual annual surplus. The surplus is strictly temporary, and generation after generation is frittered away. Whether taken by predators or otherwise lost, the surplus must disappear; population sooner or later coincides with carrying capacity."

Predators: The "vermin" question

Palmer, E. Laurence. Are they vermin?, Cornell Rural School Leaflet (Cornell University, Ithaca, N. Y.), 31(2), 32 pp., illus., Nov. 1937.

Appraisal of animals depends upon the point of view, but each observer should take into consideration the interests of others. There is a poll of 302 farmers throughout New York State showing their economic rating of various common mammals and birds, and where their information about these creatures was obtained. General discussion of birds of prey and their ecological influence. "The necessary control of harmful species and the occasionally destructive individuals of other kinds should not be given over to groups of people who are uninformed of the economics involved, who are unable to differentiate between species, or who may be influenced by propaganda." The leaflet is illustrated by numerous drawings and contains an extensive tabulation giving description, local occurrence, general range, food and life history, behavior, reactions, and relation to man's interest of 27 birds and 13 mammals including the domestic dog and cat.

Propagation: Bobwhite, feeding young

Wessell, Charles W. Raising bobwhite quail in the sportsman's pen, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 8(10), Jan. 1938, pp. 6-7, 12, 30, 4 photos, 1 page of diagrams.

Formula for mash used on the State game farms; instructions for feeding young birds week by week. The pen recommended and illustrated was more fully described in the preceding issue of the same journal, 8(9), Dec. 1937, pp. 6-8, 26-27, 2 photos, figs.

Propagation: Irradiation results, pheasant

Bissonnette, Thomas H., and Albert G. Csech. Hatching pheasant chicks on Christmas day, Amer. Nat. (Science Press, Lancaster, Pa., $1.00 a copy), 71(736), Sept.-Oct. 1937, pp. 525-528.

Authors' summary: "(1) One cock-pheasant and four hens, 151 days of age, were subjected to gradually increased night-lighting from October 5 to December 5; (2) breeding plumage and behavior was assumed within eight days and first egg laid by one hen on November 8; (3) eleven eggs were laid by one hen before cessation on November 28. The other four hens failed to lay, probably because of more nervous temperament and frequent disturbances; (4) of ten eggs set on November 29, three hatched at 26 days of incubation on Christmas day, one completed incubation but failed to hatch, and one developed till the egg was broken at two weeks. This is 50 per cent. fertility and 30 per cent. hatch; (5) both sexes therefore were completely activated at 185 days of age, with chicks hatched 138 days earlier than normally; (6) it is possible to get pheasant eggs at any time in autumn, winter, and spring and have chicks hatched and reared for liberation whenever desired if warm brooder houses are used."

Research: Need of

Gabrielson, Ira N. The need of research, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 26(5), Sept.-Oct. 1937, pp. 71, 78.

Laws and regulations should be made in accordance with the needs of wildlife. Research is required to show what the real needs are, and to the extent of its success depends the accomplishments of a wildlife program. Instances are given of the services of research to wildlife management. "We must know the facts--must produce the conditions needed by wildlife and then limit the human harvest to the surpluses above necessary breeding stock that can be produced. This is the only possible way, and research must supply the answers if we are to continue to have many of our finest forms of wildlife in any abundance." The Federal-State chain of cooperative research units represents the greatest development to date of the plan for basing an adequate wildlife restoration program on the true foundation of research.

Research: Nutritive value of game bird food items

Errington, Paul L. Emergency values of some winter pheasant foods, Wisconsin Acad. Sci., Arts, and Letters (H. A. Schuette, University of Wisconsin, Madison), 30, 1937, pp. 57-68.

Foods are classed as staple, inferior, and intermediate. Staples include such things as cultivated grains and soy beans, and among wild plants pigeon grass and lesser ragweed. Experiments were made with foods of the

intermediate group to determine their emergency value. They were fed singly to the limit of consumption to penned pheasants and the measure of their adequacy was the gain, or loss, in weight of the birds. The results of the author's previous tests with quail are summarized. Gain in weight was made only on a balanced ration and on a diet of shelled corn; the birds lost at varying rates (faster at lower temperatures) on 10 other foods tested, including mixture of all of them. The rate of loss of weight diminished during the course of the test with smartweed and accelerated in that with buds and catkins. Besides these browse items, the foods experimented with included sumac, poison-ivy, and coralberry fruits; greater ragweed akenes; and sweetclover, burdock, velvetleaf, dock, and smartweed seeds.

Research: Results of Federal-State cooperative units

Couch, Leo K. Research units annual report shows progress, American Wildlife (Investment Bldg., Washington, D.C., 25 cents a copy), 26(5), Sept.-Oct. 1937, pp. 70, 76-77, 3 photos.

Brief reports on the activities of each of the regional widlife research units established in cooperation by the American Wildlife Institute, the Biological Survey, and the State conservation departments and land grant colleges in 9 States. In Maine, white-tailed deer tend to follow forest cutting operations feeding on the slash. It was learned in Alabama that fire-ants are not abundant enough to be an important factor in quail management at this time. In Walker County, Texas, there is an estimated population of 40,000 quail on 500,000 acres; isolated clearings are an important factor in quail abundance; the value of second-growth pine stands to wildlife decreased in a period of 5-9 years after cutting. Further results in Texas were the counting of about 350 Attwater prairie chickens on 100,000 acres of the best part of its range. [These birds have recently been given a 5-year close season by the State Legislature.] Studies on gray and fox squirrels in east Texas show: "(1) There is a winter and summer breeding season, (2) the greatest seasonal activity is in the spring and fall, (3) the gray squirrel prefers moist vegetation, the fox squirrel the drier, more open type of woods, and (4) over-harvesting of timber and over-grazing are affecting the number of squirrels." In Oregon the most serious mortality among young pheasants is due to wet weather. With respect to adult game birds, food and cover seem to be adequate and winters not unduly destructive. Hunting pressure is excessive in the more favorable feeding areas, but the birds may be protected to some extent by localizing them by the use of feed patches. On a favorable area in Utah, half of the beaver populations was harvested, the yield being at the rate of $1.03 per acre. Connecticut studies indicate that cottontail females range over 7-8 acres in the breeding season and over only .5-2 acres at other times.

Research: Tagging muskrats

Errington, Paul L., and Carolyn Storm Errington. Experimental tagging of young muskrats for purposes of study, Journ. Wildlife Management (Victor H. Cahalane, National Park Service, Washington, D. C., 75 cents a copy), 1(3-4), Oct. 1937, pp. 49-61, 1 fig., 2 pls., 4 tables.

Description and illustrations of tags and method of affixing them. Information relative to tagged individuals summarized in tables includes notes on growth in length and weight; sexual advancement in varying periods; cruising radius; and mortality. Experiences with the tagging system are discussed and suggestions given for further work.

Soil Conservation Service: Annual Report, 1936-37

Bennett, H. H. Report of the Chief of the Soil Conservation Service, 1937 (Superintendent of Documents, Washington, D. C., 10 cents a copy), 51 pp., 12 tables, 1938.

The section on wildlife management (pp. 30-31) states that with proper direction soil conservation means wildlife conservation. During the fiscal year reported upon, "Wildlife-management activities of the Service were divided into three phases: (1) Direct erosion-control planting made for the benefit of wildlife; (2) development of other soil conservation practices so as to enhance their value to wildlife; and (3) development of an appreciation on the part of the farmer, other conservation agencies, and the general public of the direct relationship between wildlife welfare and soil conservation." Among achievements mentioned are the planting in demonstration areas of 3,882 acres to trees and shrubs, and of 5,318 acres to herbaceous vegetation beneficial to wildlife. Planted to trees and protected by fencing were 83,975 acres; strip cropping was completed on 462,270 acres. Ponds built, fenced, and protected for wildlife numbered 2,091, and feeding stations in regions of severe winters, 10,815. Other less readily summarized activities also are described. The immediately following part of the Report on conservation nurseries will no doubt be of interest to wildlife managers.

WILDLIFE RESEARCH AND MANAGEMENT LEAFLETS

BS-95. Preserves and ranges maintained for buffalo and other big game, by Clara Ruth, November 1937, 20 pp., 12 figs.

Reasons for establishment of these reservations; history and description of 10 in the United States and one in Alaska. Notes on protection of big brown bears in Alaska, on buffalo herds other than those on Biological Survey preserves, and on improvement and development of refuges. The leaflet also includes a list of publications on big-game animals.

BS-96. Blackbirds and the rice crop on the Gulf coast, by E. R. Kalmbach, November 1937, 4 pp.

Extent of damage, area affected, legal status of the birds, their habits and control.

BS-97. Abstract of fur laws, 1937-38, by Frank G. Grimes, December 1937, 31 pp.

Summaries by States and Territories; also for Canadian Provinces.

BS-98. Colleges and universities offering courses in wildlife management, 1938-38, October 1937, 8 pp.

Recent developments in education for wildlife management with list of courses and of institutions offering them; suggestions as to training needed for wildlife research and administration.

BS-99. Disease as a factor in game fluctuations, by J. E. Shillinger, December 1937, 3 pp.

Notes on cycles and their periods; results of cooperative study of causes; suggested remedial measures.

BS-100. Annotated list and index of leaflets BS-1 to BS-100, by W. L. McAtee, February 1938, 18 pp.

Nature of the series; brief abstract of each leaflet; author and subject indexes.

Copies of the above mentioned mimeographed leaflets can be obtained from the Biological Survey, U. S. Department of Agriculture, Washington, D. C.

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